

Federal Communications Commission

WASHINGTON, D.C. 20554

In the Matter of)
) RM-9740
 Proceeding To Address)
 Network Unwanted Emissions)

RECEIVED
 DEC 20 1999
 FEDERAL COMMUNICATIONS COMMISSION
 OFFICE OF THE SECRETARY

To: The Commission

COMMENTS OF VIRTUAL GEOSATELLITE, LLC

Virtual Geosatellite, LLC ("Virtual Geo"), by its attorneys and pursuant to Section 1.405 and 1.419 of the Commission's Rules,¹ hereby submits its comments in response to the Commission's public notice in the above-referenced matter.² In its *Public Notice*, the Commission seeks comments concerning a request that it update its rules relating out-of-band ("OOB") emissions from satellite networks. This request was made via a letter submitted by Motorola Satcom, Hughes Space & Communications Corporation, and Teledesic (together, the "Petitioners"), which the Commission is treating as a petition for rule making.

At the outset, Virtual Geo supports the initiation of such rulemaking proceeding. It believes, however, that before the Commission goes any further in this matter, the Commission should establish an informal working group within the U.S. (comprised of interested industry and government representatives) to recommend specific OOB emission limits that will permit the introduction of satellite systems utilizing new and future technologies that were not envisioned when the current emission limits were developed.

¹ 47 C.F.R. §§ 1.405 and 1.419.

² *Proceeding to Address Satellite Network Unwanted Emissions*, FCC Public Notice, RM-9740 (DA 99-2601) (released November 19, 1999) ("*Public Notice*").

I. STATEMENT OF INTEREST

Virtual Geo is the applicant for a non-geostationary fixed-satellite service (“FSS”) system called “VIRGO™,” which will operate in the C-band (4/6 GHz) and Ku-band (11/14 GHz) frequency ranges using a novel highly-elliptical set of orbits. VIRGO™ will operate in elliptical planes, but, due to its design, its satellites will appear to be at geostationary orbits without interfering with geostationary FSS and broadcasting-satellite service (“BSS”) networks. This innovative VIRGO™ satellite system will permit geostationary networks a virtually unfettered opportunity to evolve their technologies and meet future service requirements.

The VIRGO™ system will rely heavily on the use of the latest satellite antenna technologies, such as phased arrays. The use of phased arrays will permit VIRGO™ to maintain near-constant beam patterns on the ground throughout its active arc, during which both the altitude of the satellite and its elevation angle are varying. Similarly, in order to track the active satellites, and to conduct the handover between VIRGO™ satellites, the VIRGO™ earth stations will use phased arrays to form two independently steerable beams. These antennas will employ amplifying devices that are physically distributed within the antenna structure, making it difficult and costly to perform post-amplifier filtering. Any unwanted emission masks that are mandated by the Commission must permit systems such as VIRGO™ to be implemented without unnecessary burden.

Virtual Geo is concerned that if the Commission were to initiate a rulemaking proceeding to determine OOB emission standards before conducting an appropriate study to determine the most appropriate OOB emission limits, the result could be the adoption of standards that would

hinder the implementation of future satellite systems, including systems like VIRGO™, thus denying the public the benefits from a vibrant and competitive satellite industry.

II. DISCUSSION

As the Petitioners observe, the current emission rules have been in existence in their present form for more than 25 years and were crafted to accommodate geostationary technologies only. Also, since the rules were adopted, there have been significant changes in the satellite industry that impact the ability to minimize unwanted emissions.³ Therefore, Virtual Geo agrees with the Petitioners' call for the Commission to initiate a rulemaking proceeding to review and revise the current OOB emission rules. Virtual Geo also provides below preliminary answers to the Commission's specific queries posed in the *Public Notice*, and suggests a method of proceeding on the complex issues raised.

A. Establishment of an Informal Working Group to Recommend Appropriate OOB Emission Limits

Virtual Geo believes that if the Commission is to effectively establish appropriate OOB emission levels within a rulemaking proceeding, it should first establish an informal working group, comprised of satellite operators, satellite equipment manufacturers, and representatives of affected government agencies. The revision of the Commission's rules relating to OOB emissions from satellites is a complex area with multiple interrelated concerns and issues given the various types of satellite technologies that exists and are emerging. This factor, in conjunction with the

³ See Letter from Motorola Satcom, Hughes Space & Communications Corporation, and Teledesic requesting that the Commission initiates a proceeding to update the Commission's out-of-band emission rules for satellite networks, RM-9740, at 1 (July 1, 1999).

time pressures that are brought to bear by the parallel international processes and the need for an updating of old rules, makes it inefficient to rely exclusively on the formality inherent in the traditional notice and comment rulemaking process.

The working group should be given the mandate to develop proposals for practical OOB emission levels that would allow the implementation of future satellite technologies and satellite systems, while protecting these and existing systems from harmful interference. The OOB emission levels that would be recommended by the working group could be used by the Commission to form the basis for proposals to be advanced in the formal rulemaking proceeding, thereby expediting the rulemaking process and facilitating the implementation of emerging and future satellite systems.

B. Virtual Geo's Responses to the Commission's Five Questions

In the *Public Notice* the Commission asks commenters to address specific questions related to the out-of-band limits that would be appropriate to impose on satellite networks.

Virtual Geo's responses are provided below:

1. Should the generic out-of-band mask be in dBc, dBs, or PFD units or some combination?

The OOB emission mask should be based on either a dBc or a dBs unit, but should not be expressed as a power flux density ("PFD") limit. Virtual Geo notes that the current mask is based on a dBc unit and has been used successfully for many years. Nonetheless, the current mask may not be appropriate for wideband systems.

2. Should the emissions of a multi-carrier system with a wideband frequency allocation be treated differently than those of a system with a single broadband carrier?

Although a single mask could be used for both multi-carrier and single-carrier systems, it is not clear whether one mask could serve this function without imposing unnecessary constraints. This is a complex issue, and the Commission should direct the working group recommended herein to study and resolve this matter.

3. Should the mask be defined as a function of authorized bandwidth (FCC approach) or necessary bandwidth (ITU approach)?

Both “authorized” bandwidth and “necessary” bandwidth are somewhat ambiguous. Neither the Commission nor the ITU have a definition of authorized bandwidth as it relates to space station transmitters. It may prove more appropriate to use the entire bandwidth for which a licensee is authorized to operate.

Again, the working group recommended herein should address the definitions of “authorized” bandwidth and “necessary” bandwidth, as well as the relationship to each other, and attempt to converge on the most appropriate bandwidth parameter to define emissions masks.

4. Should a generic mask be used for all space services allocations unless otherwise specified?

It may be appropriate, based on future study, to develop different masks for different bandwidth ranges and/or services. For example, it may be appropriate to have different masks for narrowband and wideband emissions.

5. Should the FCC Rules incorporate out-of-band values agreed in Recommendations of the ITU-R?

The Commission should base any new OOB emission mask(s) on comments received from the U.S. satellite industry. It would be preferable if the Commission’s rules and ITU-R

Recommendations were aligned, but it should not be considered to be obligatory. The ITU-R Recommendations should in fact be consistent with U.S. satellite industry views.

III. CONCLUSION

Virtual Geo agrees with the call for the initiation of a rulemaking proceeding to establish new OOB emission rules for satellite networks. The Commission should, before making specific proposals, establish an informal working group, to address the complex technical issues involved. By proceeding in this manner, the Commission will be able to effectively and efficiently update its current satellite OOB emission rules.

Respectfully Submitted,

VIRTUAL GEOSATELLITE, LLC

By: 

Raul R. Rodriguez
Stephen D. Baruch
Juan F. Madrid

Leventhal, Senter & Lerman P.L.L.C.
2000 K Street, N.W.
Suite 600
Washington, D.C. 20006

December 20, 1999

Its Attorneys

CERTIFICATE OF SERVICE

I, Tim Jordan, do hereby certify that copies of the foregoing "Comments of Virtual Geosatellite, LLC" were delivered this 20th day of December, 1999, to the following in the manner indicated:

VIA HAND DELIVERY

Thomas Tycz, Chief
Satellite & Radiocommunications Division
Internatioanal Bureau
Federal Communications Commission
445-12th Street, SW
Room 6-A665
Washington, DC 20554

Bill Luther
Internatioanal Bureau
Federal Communications Commission
445-12th Street, SW
Room 7-B454
Washington, DC 20554

Allen Yang
International Bureau
Federal Communications Commission
445-12th Street, SW
Room 7-B455
Washington, DC 20554

VIA U.S. MAIL

Mr. Charles Bucher
Director of Spectrum Standards
Motorola Satcom
c/o Jansky/Barmat Telecommunications, inc.
1120-19th Street
Suite 333
Washington, DC 20036

Mr. Tom Walsh
Manager, Spectrum Planning and Regulation
Hughes Space & Communications
c/o Jansky/Barmat Telecommunications, inc.
1120-19th Street
Suite 333
Washington, DC 20036

Dr. Jose Albuquerque
Executive Director, Technical Regulatory
Affairs
Teledesic
c/o Jansky/Barmat Telecommunications, inc.
1120-19th Street
Suite 333
Washington, DC 20036

William Hatch
International Spectrum Policy and
Management Program Manager
NTIA
Herbert Clark Hoover Building
14th Street and Constitution Avenue, NW
Room 4099A
Washington, DC 20230

Rob Haines
Office of Spectrum Management
NTIA
Herbert Clark Hoover Building
14th Street and Constitution Avenue, NW
Room 6725
Washington, DC 20230

A handwritten signature in black ink, appearing to read "T Jordan", written over a horizontal line.

Tim Jordan